CLAIMS

1. Method for anchoring a joining element (3, 3.1 to 3.4) in a part (1), which is made from a porous material having cavities (11.1) or in which cavities can be produced by pressure, the joining element being introduced into a bore (4, 4.1 to 4.4) with an inner, closed end (41), characterized in that the joining element (3, 3.1 to 3.4) is positioned in the bore in a first position and that the joining element is then pressed more deeply into the bore from the first position into a second position with a pressing force (F) oriented substantially parallel to the bore axis, the joining element (3, 3.1 to 3.4) and the bore (4, 4.1 to 4.4) being so matched to one another that the joining element can be positioned in the first position substantially without force expenditure and that on pressing into the second position pressure is built up at at least one predetermined anchoring point (31, 33) between the joining element (3, 3.1 to 3.4) and the wall of the bore (4, 4.1 to 4.4), the joining element being made from a thermoplastic material at least in the vicinity of the predetermined anchoring point (31, 33) and during the pressing of the joining element into the second position energy is supplied to the joining element in such a way that the thermoplastic material is plasticized in the vicinity of the at least one predetermined anchoring point (31, 33) and by the pressure is pressed into the pores or cavities of the part (1) and a macroscopic anchoring (10, 20) is formed.

2. Method according to claim 1, characterized in that the at least one predetermined anchoring point (31) is provided in the vicinity of the closed bore end (41) in that the joining element (3, 3.1 to 3.4) and the bore (4, 4.1 to 4.4) are so matched to one another that in its first position the joining element extends up to the closed end of the bore or rests on a cross-sectional reduction (43) of the bore in the vicinity of the closed end (41).

3. Method according to claim 2, characterized in that the joining element is a joining pin (3.2) for joining the first part (1) to a second part (2.2) also made from a porous material or provided with cavities, that the bore (4.2) passes through the second part (2.2) and that in the second part

(2.2) is provided a further anchoring point (33), so that the bore (4.2) in the second part (2.2) has a step-like cross-sectional reduction (42) and the joining pin (3.2) has a shoulder substantially corresponding to the cross-sectional reduction (42) with which it rests in its first position on the step-like cross-sectional reduction (42).

4. Method according to claim 2, characterized in that the joining element is a joining pin (3.1) and that for joining the first part (1) to a second part (2.1) the bore (4.1) passes through the second part (2.1) and the joining pin (3.1) has a head-like thickening.

5. Method according to claim 2, characterized in that for joining a first part (5, 6) to the first part (1), the second part (5, 6) is produced in one piece with the joining element (3) or is fixed before or after anchoring to the joining element (3.3).

6. Method according to ~~one of the~~ claims 1 ~~to 5~~, characterized in that the joining element (3, 3.1 to 3.4) is ultrasonically excited for supplying energy.

7. Method according to ~~one of the~~ claims 1 ~~to 5~~, characterized in that the joining element (3, 3.1 to 3.4) is made entirely from a thermoplastic material, which can be plasticized at lower temperatures in the vicinity of the at least one anchoring point (31, 32) than the remainder of the joining element and that energy in the form of heat is supplied to the joining element (3, 3.1 to 3.4).

8. Method according to ~~one of the~~ claims 1 ~~to 5~~, characterized in that, in the vicinity of the at least one anchoring point (31, 33), the joining element (3, 3.1 to 3.4) has surface areas of a thermoplastic material with metal particles incorporated therein and that the joining element (3, 3.1 to 3.4) is inductively heated for supplying energy.

9. Method according to ~~one of the~~ claims 1 ~~to 8~~, characterized in that the part (1, 2.2) in which the joining element (3, 3.1 to 3.3) is anchored is made from wood or a woodlike material.

10. Method according to ~~one of the~~ claims 1 ~~to 8,~~ characterized in that the part (1, 2) in which the joining element (3, 3.1 to 3.3) is anchored comprises sandstone, a porous, ceramic material, burnt brick or concrete.

11. Method according to ~~one of the~~ claims 1 ~~to 8,~~ characterized in that the part (1) in which the joining element (3.4) is anchored is a lightweight structural component with cavities (11) and that the bore (4.4) is a through bore through an outer layer (1.1), which is so closed by an inner layer (1.2) or by an element located in the cavity (11) that in the vicinity of the closed end of the bore (4.4) there are essentially radial openings in the cavity areas (11.1) or these are produced by the pressing force.

12. Joining element (3, 3.1 to 3.4) ~~for use in a method according to one of the claims 1 to 11, said joining element~~ having an inside to be directed against the closed end of the bore (4, 4.1 to 4.4) and an outside facing it, characterized in that on its inside the joining element (3, 3.1 to 3.4) has a first, predetermined anchoring point (31) with at least surface areas made from a thermoplastic material and a second anchoring point (33), spaced from the first anchoring point, with respect to the outside, or on said outside a head-like thickening (32) or means (34) for fixing a further part (6).

13. Joining element according to claim 12, characterized in that it is pin-like and has a second anchoring point (33) in the form of a shoulder.

14. Joining element according to claim 12, characterized in that it has an internal thread (34) as a means for fixing a further part (6).

15. Joining element according to ~~one of the claims 12 to~~ claim 14, characterized in that it is made entirely from thermoplastic material.

16. Joining element according to claim 15, characterized in that, in the vicinity of the predetermined anchoring points (31, 33), the thermoplastic material is plasticizable at a lower temperature than the thermoplastic material in the other areas of the joining element.

17. Joining element according to ~~one of the~~ claims ~~12 to~~ 14, characterized in that it comprises a thermosetting material and at the predetermined anchoring points (31, 33) has surface areas of a thermoplastic material.

18. Joining element according to ~~one of the~~ claims ~~12 to~~ 14, characterized in that in the thermoplastic material it has metal particles incorporated into the vicinity of the predetermined anchoring points.

19. Joining element according to ~~one of the~~ claims ~~12 to~~ 18, characterized in that it is pin-like and tapers to a point on its inside, or has a flat or concave face.

20. Joining element according to ~~one of the~~ claims ~~12 to~~ 19, characterized in that the thermoplastic material is a polyamide, a polycarbonate or a polyester carbonate or acrylonitrile-butadiene-styrene, styrene-acrylonitrile, polymethylmethacrylate, polyvinyl chloride, polyethylene, polypropylene or polystyrene.

21. Use of the method according to one of the claims 1 to 11 and a joining element according to one of the claims 12 to 20 for joining the individual parts of solid wood shutters or window frames.

22. Use of the method according to one of the claims 1 to 11 and a joining element according to one of the claims 12 to 20 for fixing fittings to chipboards or lightweight structural components.

add B3

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